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OBSERVATIONS

ON THE

SULPHUR-WATER,

AT

CROFT, NEAR DARLINGTON.

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By ROBERT WILLAN, M. D.

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TO

SIR JOSEPH BANKS, BART.

PRESIDENT OF THE ROYAL SOCIETY,

THE FOLLOWING TREATISE

IS INSCRIBED BY

HIS MOST OBLIGED,

AND HUMBLE SERVANT,

THE AUTHOR.

OBSERVATIONS

ON THE

SULPHUR-WATER, &c.

AS nature hath conſulted the convenience and neceſſities of human life, in diſpenſing every where, with liberal hand, the ſimple element of water; ſo hath ſhe provided an alleviation of human miſery, by impregnating, in particular ſituations, that element with principles which are found extenſively uſeful in the cure of diſeaſes.

To the former we are familiarized, and forget to be thankful; yet we ſee it in the various form of rain, dews, and vapor, in ſprings, rivers, or in ſeas, equally neceſſary to the production of minerals and vegetables, and to the life of animals, removing from theſe whatever is noxious or diſagreeable, quenching their thirſt, obviating the effects of heat, and conveying nouriſhment through the whole body. The latter being more rare, hath at all times attracted the notice of philoſophers; and the medicinal qualities of ſuch waters have been gratefully acknowledged by many ſufferers, whom they reſtored to health and enjoyment.

It is, however, to be regretted, that we have not a regular ſyſtematic account of the moſt eſteemed mineral-waters, particularly in this kingdom. No great benefit is to be derived from the general treatiſes publiſhed ſome time ago, which afford but a tedious detail of experiments not much to the point, or theoretical explanations involved in metaphor and obſcurity, without adding to our real knowledge. Later improvements in chemiſtry give us new light in proſecuting theſe reſearches, teaching us to aſcertain by accurate experiments, the true contents of mineral waters, fixed or volatile, and eſtabliſhing the proper teſts for detecting the different ingredients.

The ſulphureous waters have always born the moſt diſtinguiſhed rank, poſſeſſing the ſtrongeſt ſenſible qualities and active principles of conſiderable importance in curing diſeaſes. Many diſputes have ariſen with regard to theſe waters: Some even deny the exiſtence of ſulphur in them, and inſtead of it,

ſuppoſe

ſuppoſe a combination of ſulphureous principles in a different form, or an oily matter undergoing putrefaction. It is not yet on the whole determined, whether the ſulphur be diſſolved by an intermediate ſubſtance, or all the appearances depend on a volatile ſulphureous vapor generated in the bowels of the earth. Theſe doubts made me gladly embrace the opportunity of reſiding near a curious ſpring of this kind, to enter on a courſe of experiments, in order to ſatisfy myſelf with reſpect to its nature and contents. The reſult may perhaps be not diſagreeable to the public; at leaſt the compariſon of this, with others of a ſimilar quality, will be a matter of curioſity, and I hope of ſome advantage.

The ſulphur water at Croft has been long known and employed with ſucceſs. Dr. Short, in his elaborate treatiſe, takes ſome pains to recommend it in the following account:

" The next ſulphur-water of note, after Harrogate, is *Croft Spaw*, within the borders of Yorkſhire, and on the confines of the biſhopric of Durham, very near Darlington. This has merited a great reputation, and is much frequented in the ſeaſon, has done many very eminent cures, both by bathing and drinking. It is in the pariſh of Croft, about half a mile from the church; is in a charming ſituation, riſes up ſouth-eaſt; was firſt taken notice of, and brought into fame by Sir William ——*, in whoſe Lordſhip it laid. It is a fine clear ſparkling water, ſmells ſtrong of ſulphur; nor does its ſtream riſe or fall by rain or drought: the place lies all upon limeſtone: every thing in its courſe becomes white with reddiſh ſpecks between. It is drank from four pints to nine.

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* The gentleman here referred to is Sir William Chaytor, ſon, or grandſon of Sir William Chaytor, who was created a baronet in the 26th year of Charles II. June 28, 1671. Croft Hall ſtill remains in the poſſeſſion of the ſame family.

" This place deſerves greater reſort, having done ſeveral cures by bathing and drinking."

The ſpring is on a hillock, from which the ground riſes gradually every way, except to the eaſtward: it ſeems to be conſiderably above the level of the river. Two ſmall brooks flow on each ſide, not perceptibly tainted with the ſulphur principle. There is a film on theſe where ſtagnant, which we ſhall prove, owing to the preſence of iron. The ſpout, the leaves, ſtones, &c. near the ſpring, are covered with a white flocculous or filamentous matter, which is not found many yards below in the ſtream, nor does the water retain its ſenſible qualities ſtrongly to any great diſtance. The ſoil is clayey; of minerals, I could only find in the breaks of the ſtrata, near the place, coal, ironſtone, and limeſtone.

The water itſelf is clear and ſparkling, ſmells ſtrong of the ſulphur, is pungent to the taſte, and by no means ſo nauſeous as moſt others of this claſs. It tarniſhes ſilver in a ſhort time, either when put into it, or held in the exhaling vapor.

The flow is very copious, amounting to two hundred gallons and more per hour from the ſpring within the preſent bath. There is another pipe adjoining with a ſmaller ſtream, which may afford about half that quantity.

Croft water was compared, in reſpect to weight, with the water of the river Tees; but though tried at different times, and in different quantities, the weight was exactly the ſame in each.

It is ſaid to be colder than common ſprings, I believe without reaſon. July the 2d afternoon, thermometer ſtanding in the open air at 73°, I found its heat as iſſuing out to be 51°½. September 20, 8 A. M. thermometer at 56°. it was exactly the ſame, two degrees above the temperature of caverns and common ſprings.

The white hairy mucous matter on the ſticks, graſs, &c. in the courſe of ſulphur waters, is ſuppoſed to prove the exiſtence of real ſulphur in them, burning blue, it is ſaid, with the ſmell of ſulphur. I collected a quantity of it, and after drying, applied it to a hot iron, but no part of it melted; neither did it flame when held to a candle, only burnt away with a diſagreeable herbaceous ſmell. Examined by a microſcope it was evidently a vegetable ſubſtance, anſwering to the character of Byſſus, though a ſpecies not deſcribed in the ſyſtem of Linnæus. The appearance, when thus magnified, is very beautiful; the ſmall ſimple filaments of the Byſſus, take the threads of conſerva rivularis, or of moſſes growing in the ſpring, as middle-ribs, and go off thence very cloſe together in form of a feather; it ſeems therefore to be one of the paraſitical plants. It is a remarkable circumſtance, that this

Byſſus is found below the ſpring, no further than the water retains the ſenſible ſulphureous qualities, as if the hepatic gas was neceſſary to its production and nouriſhment. The following deſcription and arrangement ſeem moſt ſuitable:

Lanuginoſa Byſſus filamentis ſimplicibus, tenuiſſimis, albis.
Habitat in fontibus præcipue ſulphureis,
Conſervis adhærens, lapideſq. &c. obtegens.

At Dinſdale, about three miles from Croft, on the Durham ſide of the Tees, in another ſimilar ſpring, it is found in great abundance.

EXPERI-

EXPERIMENTAL HISTORY.

I NEXT tried various experiments on the water, in order to diſcover the contents, whether ſaline, metallic, or earthy.

A ſolution of *ſaccharum ſaturni* dropped in, made inſtantly a milky appearance and precipitation, as it does with all waters containing calcareous earth, or earth joined to an acid.

Soap was decompoſed and curdled.

A ſtrong ſolution of galls being added to an equal quantity of the water, did not cauſe any alteration in the color, but a ſhining variegated film formed on the ſurface; ſimilar to what is ſeen on many ſtagnant waters, called by workmen Iron-waters.

To determine whether it was really a calx of iron, I dipped a knife in vitriolic acid, and afterwards in infuſion of galls. The ſurface of the metal exhibited exactly the ſame variegated appearance, which might be rubbed off, or communicated to the infuſion, ſpreading along the top of it. I collected alſo a quantity of the film from this and other waters where ſtagnant, and diſſolving it in ſpirit of ſalt, added to the ſolution an infuſion of galls, the mixture became inſtantly of a dark green, or black color, and a ſlight film formed again on the ſurface. Hence we may conclude, that galls more readily ſtrike a black color with ſolutions of iron in the ſtronger acids, but have not an equal effect when it is ſuſpended by fixed air. Galls, however, as we have ſhewn, become a ſatisfactory teſt in the latter caſe, in a way which has not been generally attended to.

Alcalis, as *Lixiv. Sapon.* or rather perhaps the cauſtic, may be uſed for the ſame purpoſe. It throws to the ſurface a ſhining white or yellowiſh film, with other properties the ſame as above deſcribed.

By the aſſiſtance of theſe two teſts we may perhaps diſcover the preſence of iron ſo ſuſpended, in many waters not ſuppoſed to have any mineral impregnation.

There is then a ſmall portion of iron diſſolved in thoſe waters, which may be diſengaged by the aſtringent vegetables growing in them, and eſcape of the mephitic gas or air. It is not amiſs to have aſcertained this point, as the film appearing on the ſulphureous waters was, by Dr. Rutty and others, taken, without reaſon, for ſulphur, or an oil.

Syrup of violets, diluted with the freſh water, turned a little greeniſh. *Infuſion of Litmus* underwent no alteration.

Lime-water added to it, ſuffered an inſtant decompoſition, and depoſited the lime on the ſides of the glaſs.

Lixivium ſaponaceum turned the water immediately milky, with a ſtrong ſmell as from lime; a large quantity of air bubbles aroſe, and a ſhining ſcum formed on the top, not variegated. The ſediment was browniſh and flaky; ſome part of it diſſolved again with vitriolic acid, the remainder being waſhed with freſh water repeatedly, efferveſced with acids;

the compounds inſoluble in water, except that with marine acid.

Spir. ſalis ammoniac. cum calce viva made a white precipitation, which diſſolved again entirely, by pouring in a little vitriolic acid.

Vitriolic acid made no change in the color, but a diſcharge of an immenſe quantity of air bubbles. In four hours no precipitation enſued: the other acids made no alteration; nor was the diſcharge of air bubbles ſo conſiderable.

The contents of the water as obtained by evaporation, were ſuch as might have been expected from the trials by mixture.

Three quarts evaporated to dryneſs, left a reſiduum of two drams, one ſcruple, partly in form of a white powder, partly in ſpangled flakes. To ſeparate from this ſediment all the ſaline parts, pure rain water was poured on it repeatedly: after filtration there remained about four ſcruples of a white calcareous earth, which efferveſced ſmartly with vitriolic acid. The ſalts, after evaporating the water, weighed together one dram. Cubical cryſtals firſt formed, which decrepitated when applied to a red-hot iron *. As the

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* I previous determined the preſence of ſea-ſalt, by dropping ſolution of ſilver into this watery ſolution of the ſalts in the ſediment; a white cloud and coagulum formed inſtantly, which is a certain teſt of that ſalt being contained.

After the ſalts had been evaporated to dryneſs, and water again poured on them, my friend Mr. Brown, chymiſt, turned the clear ſolution green with ſyrup of violets, whence he ſuſpects there is a ſmall quantity of foſſil alcali alſo in the water.

the water cooled, other cryſtals appeared of an irregular form and bitter taſte, which deliquiated in the air. I diſſolved ſome of theſe in freſh water, and dropping in Lixivium Sapon. made a flocculous precipitation, which rediſſolved by vitriolic acid. A ſolution of the bitter purging ſalt tried in the ſame way, afforded exactly the ſame appearances.

This ſalt, therefore, ſeems to be a compound of vitriolic acid, and a calcareous earth, or rather magneſia, ſimilar to the Epſom ſalt. The proportion of this is much the greateſt; of a ſcruple, the whole quantity contained in a quart, only four or five grains were ſea-ſalt, as nearly as I could determine.

Dr. Short's analyſis is not much different from mine. "Nine quarts of it exhaled, he ſays, left twenty ſcruples of ſediment very white, and ſmelling ſtrong of hawthorn flowers.

This ſediment afforded ſix ſcruples of ſalt, ſo that the ſediment is to the vehicle as 1 to 354½. This ſalt diſſolved, and ſet to cryſtalize, projected about two parts nitre, and a third part common ſalt."

This ſalt has been called nitre, or calcareous nitre, very improperly, as the acid combined with the earth is not the nitrous. In that caſe vitriolic acid would diſlodge it with ebullition and fumes, making at the ſame time, a new compound.

COMPARATIVE EXPERIMENTS

ON

HARROWGATE WATER.

Harrowgate water being poured on powdered *galls*, a variegated ſcum covered the ſurface, which diſſolved again by vitriolic acid.

When *Alcaline lixivium* was dropped into the water, a light browniſh precipitation followed, and the ſulphureous ſmell almoſt vaniſhed; a white ſhining film formed on the top: this, as well as the earth diſſolved again, by adding a little vitriolic acid, and the ſmell of ſulphur was reſtored. The other acids alſo reſtore the ſmell of ſulphur thus deſtroyed by an alcali *.

Vitriolic, or *nitrous acid*, put alone into the water, made it preſently milky.

Spirit of ſalt had no effect at firſt; on ſtanding ſome time there was the ſame milky appearance.

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* Theſe Phænomena may perhaps be accounted for by the well-known affinity betwixt alcalis and ſulphur. If the alcali attracts the hepatic gas, it muſt neceſſarily ſuppreſs its volatility, arreſting, as it were, the particles which would fly off and produce the ſmell. Or if the hepar be the calcareous, may not a decompoſition take place, the alcali precipitating the earth, and forming cloſer union with the ſulphur?

When acids are added, the ſulphureous vapor is ſuddenly ſet at liberty, and conſequently the ſmell reſtored, or even increaſed for a moment.

The mixtures continued the ſame for a day or two, except that with vitriolic acid, which became clear and pellucid at top, coating the inſide of the glaſs with a light granulous precipitation. This collected, melted in moderate heat, and inflamed by the contact of fire. The others had alſo left a ſlight coating on the glaſs, inſoluble in acids or alcalis.

Some *hepar ſulphuris* was diſſolved in water; an alcali took away the ſmell; vitr. acid made it as ſtrong, or ſtronger than before, but it ſoon went off. Vitriolic acid made the ſolution milky; it continued ſo for ſeveral hours, but the ſulphur was at laſt depoſited.

It muſt be obſerved, that when Harrowgate water had been kept expoſed till its peculiar ſmell was gone off, the addition of acids did not turn it milky, or make any viſible alteration.

It appears from the experiments, that a ſmall quantity of real ſulphur is contained in Harrowgate water, under the form of a hepar, which is further proved by the bottles of it when kept a long time; a white rim forms on the neck, over the water, and anſwers to all the characteriſtics of ſulphur *.

There

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* This laſt is rather a proof of ſulphur exiſting in the water uncombined, as will appear from the following experiments: I impregnated pure water with the gas ariſing, by pouring vitriolic acid on a ſolution of hepar ſulphuris; it took a very ſtrong impregnation, and appeared a little turbid. Acids and alcalis made no precipitation or viſible change. Keeping it cloſe corked, the following day a precipitation was made, and the water became clearer. The ſediment collected, proved to be ſulphur, which had undoubtedly been carried up along with the gas.

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There is not, from any of the trials on Croft-water, a proof of a ſulphur exiſting in bodily form. Its ſulphur principle is aërial, or what is termed by Bergman, hepatic gas, an elaſtic fluid, ſimilar to that produced by decompounding liver of ſulphur with an acid.

I endeavoured to obtain the volatile parts by the following apparatus: a cork, perforated with a glaſs tube, was well fixed in a bottle of the water and ſealed.

The celebrated Bergman is of opinion, that ſulphur is ſoluble in water, by means of the gas ſulphuris. It is certainly evident, that ſulphur may thus be at leaſt ſuſpended, or diffuſed a conſiderable time, for my impregnated water, after clearing itſelf, continued to depoſite ſeveral days.

N. B. That portion to which vitriolic acid was added, emitted a ſtronger ſmell, and for a longer time, than the ſimple impregnation.

A bladder, from which all the air was carefully preſſed, was tied firmly round the cork, and again round the tube above the cork. After keeping the bottle in boiling water for the ſpace of three hours, a quantity of air diſtended the bladder, which, from the bulk of water it expelled from a glaſs meaſure, marked with equal diviſions, I concluded to be betwixt three and four ounce meaſures.

I then paſſed the air through the tube into a ten ounce vial of lime-water, its neck being plunged in a baſon of the ſame. The lime was precipitated; and on agitating the phial, in order to make an abſorption of all the mephitic gas, I found a reſiduum, which occupied the ſpace marked on the phial for two ounce meaſures. This was the hepatic gas, which, upon trial, did not prove inflammable, though it ſmelled ſulphureous like the water.

From Dr. Higgins' Analyſis of Harrowgate water, a Wincheſter gallon contained four ounce meaſures of the acidulous gas, beyond the quantity retained by the calcareous earth in the heat of boiling water, and 35 ounce meaſures of fetid inflammable gas, ſuch as may be extricated from calcareous liver of ſulphur, by vitriolic acid.

With reſpect to the other contents of theſe waters, the Harrowgate has ſmall proportion of calcareous earth: its ſalt is principally ſea-ſalt. From the analyſis, the quantities are determined thus:

A Wincheſter gallon contains,

	oz.	*dwt.*	*gr.*
Calcareous earth ſaturated with acidulous gas	0	1	12¼
Marine ſalt of magneſia	0	4	23¼
Sea-ſalt	1	7	12½

MEDICINAL QUALITIES.

THE ſtrength and contents of theſe two waters are ſo different, that we may reaſonably expect conſiderable differences in their effects on the body and its diſeaſes. Croft-water has more Epſom-ſalt, and but a ſmall proportion of ſea-ſalt: The briſkneſs and large proportion of calcareous earth taken up, ſhew it to be more replete with mephitic gas, or fixed air, than the Harrowgate. It therefore poſſeſſes, in ſome meaſure combined, the advantages of ſulphur waters, and of thoſe whoſe utility ariſes principally from an impregnation with *that* air, ſuch as Pyrmont, Seltzer, &c.

From this view it may perhaps not be difficult to explain the different caſes in which the preference is due to either of theſe waters.

Sea-ſalt is the moſt heating of all the neutrals, and peculiarly ſtimulating to the muſcular fibre, acting even as rubefacient. Hence in external application it is an uſeful diſcutient of indolent tumors, and has been found very efficacious in ſeveral obſtinate caſes of chronic rheumatiſm, attended with loſs of activity, or vigor in the part.

On the ſame principle it muſt be improper for inflammatory habits, or in topical inflammations where the action of veſſels is increaſed. This I would apply to two caſes of diſeaſe, for which this claſs of waters is principally recommended; I mean ſchrophula, (one ſpecies of it at leaſt,) and incipient conſumptions.

They have, as is generally ſuppoſed, a common prediſpoſition; affect thoſe of the ſanguine habit, occur at the period moſt liable to inflammatory diſorders, and often require, eſpecially the latter, a cooling regimen to conſiderable extent.

The ſtrong ſulphur waters, with marine ſalt, of Harrowgate and Moffat, or ſea-water itſelf, are then prejudicial, and hurry on the tubercles rapidly to ſuppuration. The ſame objection does not lay againſt the milder waters of this kind: My worthy friend and patron, the late eminent Dr. Trotter, informed me from very extenſive experience, that he had known ſchrophulous tumors of the glands, which Harrowgate water rather aggravated, yield readily to the uſe of Croft-water; and had reaſon to think, that tubercles of the lungs might be reſolved by it, from ſeeing the ſymptoms of an incipient conſumption often entirely removed. Dr. Short's ſentiments are conformable to what I have above delivered. "Croft, Crickle and Broughton, which have leſs ſalt and a mixture of nitre, are therefore leſs heating, drying, and ſtimulating, but more cooling, attenuating and diluting, and therefore better adapted to choleric fixed lean bodies; ſuch as have a quick ſharp ſmall pulſe, and hectically diſpoſed. But of all thoſe, Croft Spaw, as it contains moſt nitre, is beſt. Theſe alſo anſwer the intents of ſulphur, according to the quantity they contain of it; and alſo the deſign of ſalt according to their ſundry quantities, which there is no occaſion to repeat, nor to ſet or preſcribe particular rules: only as the former, Harrowgate, &c. were more irritating, heating, drying and evacuating, they may be uſed with greater freedom by paralytic, dropſical, icteric and phlegmatic bodies; and the laſt more freely by choleric, thin, hectically diſpoſed perſons." Vol. I. p. 316.

The ſame author has ranked Croft-water along with Harrowgate, as uſeful in various other diſeaſes. Vol. I. p. 314.

"Since, therefore, Harrowgate, Crickle, Croft, &c. are ſo plentifully ſtored and impregnated with ſulphur, of what eximious force and virtue muſt they be in removing and remedying outward diſorders; how powerful diſcuſſers of morbific humours fixed in any of the extreme or external parts? From this healing, drying, diſcuſſing, penetrating principle it is, that they cure ſwellings, aches, pains, numbneſs, ulcers, ſchrophulous, or other ſcab, itch, leproſy, tetters, ringworms, creeping, ſpreading and inflamed excoriations,

tions, by waſhing, bathing, and fomenting."

I ſhall point out more particularly the diſorders in which Croft water has been found of advantage. From the impregnating principles it muſt, when applied externally to the body, communicate a more powerful ſtimulus than cold water alone. How far abſorption from the ſurface may extend this, cannot be exactly aſcertained, but it certainly deſerves to be taken into conſideration. Thus the water will be more bracing than ſimple cold bath, and hath been found ſo in many caſes of *chronic weakneſs*, with emaciation, not owing to any topical cauſe, but rather to bad habit of body, or general relaxation. On the ſame account it is uſeful in fluor albus, * and other diſorders incident to the fair ſex. Old gleets will alſo yield to the uſe of Croft water: in one particular inſtance I knew it ſucceed after the cold-bath, Scarborough, and other medicinal waters had failed.

It is often very ſerviceable to many, with whom ſea-bathing diſagrees, whether the ſalt-water be too ſtrong for weak and delicate conſtitutions, or the ſea air too keen and piercing. Weakly and de-

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* Menorrhagia from relaxation, and conſequent ſterility, are moſt properly treated in this way; nor is Croft Spa without its fame in thoſe inſtances.

licate children in particular, by bathing in Croft water, have, in a ſhort time, been reſtored to health and vigor. The *rickets*, which depend upon, or are nearly connected with this habit in children, and generally prove very obſtinate, yield more readily to this treatment than any courſe of medicines. Indeed it is difficult, at a tender age, to make them take internally, what might be proper, for any length of time.

There is an *inflammation* of the *eyes*, a common attendant on ſchrophulous complaints, and which ſometimes occurs in infants without any other appearance; the cure is not unfrequently tedious, nor if attempted by external application of aſtringents, &c. without danger. I know however, from many caſes, that a proper uſe of this mineral water, is a ſafe and effectual remedy.

The caſes recorded of this kind are the moſt numerous, and the cures performed almoſt miraculous. When the eye-lids were much enlarged and ſore, with perpetual flow of tears, and viſion much impaired, a compleat cure has been made in leſs than a month, and every diſagreeable ſymptom removed.

With regard to its internal uſe, I muſt obſerve, that it agrees well, ſits light and eaſy on delicate ſtomachs. When the ſtomach is primarily affected from a relaxed irritable ſtate, with ſourneſs, flatulence, acidity, and the other ſymptoms of indigeſtion, the internal uſe of the water along with bathing, is of the greateſt advantage. The calcareous earth contained abſorbs the acid; while the fixed air extricated, proves a grateful ſtimulus.

The quantity proper to be taken at one time, cannot be the ſame in all conſtitutions. It is generally uſed from one pint to three; the quantity neceſſary to purge, rather overloads the ſtomach, and it is better to take a quarter of an ounce of ſome ſalt along with a pint of it, which moves moſt people.

A claſs of diſeaſes very extenſive and very obſtinate, is the *cutaneous*, comprehended under the general term ſcurvy, for which ſulphur waters are accounted ſpecific. They appear in many different forms of eruptions, blotches, pimples, running ſores, or dry ſcaly cruſts. Their cauſes and theory are involved in great obſcurity: ſome ſuppoſe them to originate from acrid matter in the circulation, which is thrown out upon the ſurface of the body. Nor does it indeed ſeem unreaſonable, that an acrimony in the blood, produced by improper diet or bad aſſimilation, ſhould more particularly affect the veſſels of the ſkin, whoſe ſenſibility is greateſt, whoſe minute ramifications expoſe them to cloſer contact with any morbid matter paſſing through. An acrimony in the fluids does not, however, at all times, ſeem to be the immediate or proximate cauſe of ſuch diſorders. We may place it on many occaſions in a bad ſtate, or preternatural action of the cuticular veſſels, owing either to a direct external ſtimulus applied to them, or to an indirect one from ſympathy with other parts. Thus ſome kinds of aliment taken into the ſtomach, eſpecially ſalmon, muſcles, and other fiſh of difficult digeſtion, or improper mixtures of food, will, in certain conſtitutions, produce an inſtant eruption over the ſurface of the body, which muſt be a ſympathetic action in that part, as it takes place before a communication of the acrimony itſelf from the ſtomach to the ſkin can be ſuppoſed. This diſorder of the ſkin, by any repetition of ſuch diet, is apt to become confirmed and habitual.

Direct irritations to the veſſels of the ſkin by rubbing, the application of acrid ſubſtances, or accumulation of ſordes, alſo produce various cutaneous affections, as puſtules, cruſts or ſores, which exude a corroſive ſanies.

Another proof than an improper ſtate of the ſkin conſtitutes the immediate cauſes of ſuch diſorders, is their being hereditary. I have obſerved many of them run in families, and prove extremely obſtinate in the cure. That an acrimony of the fluids ſhould be transferred from one to another ſucceſſively, is not eaſily conceivable. Few, on the other hand, are ignorant, that the ſtructure of particular organs, prediſpoſing to diſeaſe of thoſe parts, is frequently communicated in this way.

The matter thrown out on the ſurface, may, therefore, often be not the cauſe, but the conſequence of a new or morbid action in the extreme veſſels, produced by ſome of theſe means. The action or ſecretion being once begun, as in many other caſes, is apt to become confirmed and habitual; and to ſuppreſs it then is difficult or dangerous. If the diſcharge be conſiderable, nature muſt accommodate herſelf to it, and provide a ſupply. The conſequence of ſuddenly ſuppreſſing the diſcharge of matter, will, therefore, be an error both of quantity and quality in the fluids, the proceſs of ſanguification remaining the ſame. Beſides this, it ſeems to be a law of the animal body, that the prevention of one action occaſions another ſympathetic action in ſome part of the ſyſtem. Thus a ſuperficial inflammation ſuddenly repelled, is often ſucceeded by an inflammatory action in ſome of the viſcera. A ſuppreſſion of the menſtrual diſcharge brings on hemorrhage from the lungs, or inflammation and tumors of the mammæ.

In the ſame manner theſe affections of the ſkin, haſtily repelled by the application of mercurials or aſtringents, bring on internal diſorders of the lungs, ſtomach or head; aſthma, bad digeſtion, congeſtions of the viſcera or head, and epilepſy.

The remote or external cauſe of ſuch diſorders, cannot eaſily be referred to any particular ſpecies of diet. Overloading the ſtomach by quantity, and food of improper quality difficult of digeſtion, equally injure the ſtate of the ſkin, and produce ſuperfluous humours.

Why are the nations of the north, and eſpecially this kingdom, more liable to cutaneous affections? Too much animal food, dried and ſalted meats, or unfermented bread, with ſmall proportion of vegetables, can be no *general* cauſes at this day: nor will our cold, moiſt atmoſphere alone account for it. A more probable reaſon may be found in our neglecting the uſe of baths, which are ſo frequent and neceſſary in warmer climates. We ſuffer the perſpirable matter perpetually exhaling to condenſe on the ſurface of our bodies. It accumulates, hardens, forms a cruſt on the ſkin, and ſtopping the pores, forbids an exit to the fluid, which nature deſigned to throw of. This, therefore, ſtagnates, turns acrimonious, ſtimulates the extreme veſſels, raiſes the cuticle in puſtules, makes determination of the fluids and running ſores. No wonder then, if in the ſpring, ſo many people complain of uneaſineſs, heat, and itching of the ſkin, or various internal diſorders, not having waſhed their bodies perhaps for ſeven or eight months of winter. Some have omitted this point of cleanlineſs for ſeveral years, and muſt therefore ſurely experience all the evils ariſing from ſtoppage of perſpiration, eſpecially at thoſe ſeaſons when it is required to be moſt copious.

In attempting a cure of the confirmed diſeaſe, we ought to proceed gradually, and have in view all the different circumſtances. In plethoric habit, which often attends theſe complaints, it is proper to drain off a portion of the fluids by purging. Many mineral waters have the purgative quality of themſelves: if not ſufficient, a ſmall addition of Glauber's ſalt will increaſe it to the degree required. To prevent diſagreeable ſymptoms from ſuppreſſing a morbid diſcharge of matter, abſtraction of the redundant fluids by purging, is not ſuppoſed to be ſo effectual as an artificial drain by iſſues, which ſeparate from the blood a matter more nearly of the ſame kind. Whether one be really a ſubſtitute for the other is not eaſily determined; but practice ſeems fully to have aſcertained the utility of iſſues in many ſuch caſes.

With theſe cautions, and perhaps a few others, which will be obvious to every attentive practitioner, the uſe of this mineral water externally and internally, is with ſafety entered upon. In the former way, beſides the effects of a cold-bath, the ſulphur principle contained has the property of obviating in a manner not eaſily explained, the morbid action of the cuticular veſſels, for it appears that ſulphur, in other forms, will produce the ſame effect, though perhaps not ſo compleatly.

By its mode of ſuſpenſion in mineral waters, it ſeems to become more active and penetrating when given internally, yet without any ſtimulus that may occaſion danger by a ſudden alteration in the part or whole of the ſyſtem.

The merit of Croft-water * in curing these

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* Its active powers are eminently ſhewn by what many ſcorbutic people have obſerved, of its relieving internal complaints, by occaſioning an eruption on the ſurface of the body, and that often in a very ſhort time.

theſe diſorders, compared with others of the ſame claſs, cannot be preciſely determined. It will be ſufficient to ſhew the ſeveral caſes and examples in which it has been found of effectual ſervice.

In the period of infancy and youth, determination of the fluids is made more to the ſuperior parts; hence children are liable to eruptions there, the tinea capitis or ſcald-head, diſcharges off ſharp ſerous humor from the lachyrymal gland, purulent inflammation of the eyes, &c.

Young perſons are alſo ſubject to the itch and other cutaneous diſorders, chiefly on the hands, arms and back.

In old age the inferior extremities are expoſed to various affections, inflammatory ſwelling and tenſion, defluxion of humors of the eryſipelatous kind, and other eruptions depending on the ſcorbutic habit, joined to weakneſs of circulation, whoſe termination is frequently in ulcers, very obſtinate and difficult to cure. In all theſe caſes the water of Croft has been employed with eſſential ſervice, and particularly in the laſt inſtance. Defluxions on the legs not yielding to the common courſe of medicines, have, by bathing and drinking it regularly, been entirely removed in the ſpace of a few weeks.

There are other more general diſeaſes of the ſkin, under the denominations of herpes and lepra. Our leproſy appears, for the moſt part, in the form of dry ſcurf or ſcales, without much inflammation or riſing of the ſkin, attended commonly with ſome internal complaints from the near connexion of the ſkin and general habit. The herpes is ſtill more diſagreeable and inveterate, being a ſcabby, ſpreading eruption, with diſcharge of ſerous ſanies, apparently corroſive. It has been divided into many ſpecies, only differing perhaps in degree. For every kind of theſe moſt loathſome eruptive diſorders, the ſulphur waters have at all times been found the ſureſt, if not the only remedy. I may ſay with ſafety, the water of Croft is not inferior to any of theſe, as appears from a number of ſucceſsful cures, all the particulars of which would take up more room than the preſent performance can admit of.

There are ſome anomalous diſorders, likewiſe, in which it is of ſervice. Gravel may be particularly mentioned, which frequently depends on a languid circulation, and improper ſecretion in the kidney. The water, I find from experiment, has a much more conſiderable and permanent effect as a diuretic than common water; muſt therefore be well adapted, by increaſing the flow of urine, to waſh out ſabulous concretions from the pelvis, ureters and bladder, and perhaps alters the ſtate of the ſecreted liquor, making it leſs liable to form ſuch depoſitions.

It is much employed by the country people in chronic rheumatiſm. In ſtiffened and enlarged joints from that cauſe, weakneſs and loſs of motion, it has performed ſeveral cures, of which the crutches formerly hung up, were teſtimonials.

Sulphur waters are commonly reckoned a certain and ſafe remedy for worms; the Harrowgate has deſerved particular fame, and cures independent of any evacuation. I make no doubt Croft-water is alſo effectual, but have not ſeen it uſed in more than one caſe, where indeed it removed all the diſagreeable ſymptoms.

I muſt obſerve, that Croft Spa was formerly known and employed more extenſively than now; much company reſorted to it from different parts of the kingdom. The water ſealed in bottles was ſold in London, and gained much eſteem; but ſince more ſuitable accommodations have been made at other places, it has been in ſome meaſure forſaken from the want of equal conveniences, and its advantages are principally experienced by the neighbouring country, or towns and villages adjoining.

I hope, however, its uſe may be extended according to its merits, as the preſent proprietor and lord of the manor, William Chaytor, Eſq. of Spennithorn, member for Heydon, in Yorkſhire, propoſes to build a new bath, with dreſſing rooms, &c. for the ladies ſeparate, and a houſe upon the ſpot, with proper rooms for the accommodation of company. There is alſo in the town of Croft a very good inn; or to ſuch as chooſe private lodgings, ſeveral agreeable farm-houſes adjoining. No ſituation can be finer or more convenient than that of Croft: it ſtands along the river Tees, bordering on the moſt fertile parts of Durham and Yorkſhire, three miles from Darlington, twelve from Northallerton. The great north road from London to Newcaſtle and Edinburgh paſſes through it. There is a poſt every day, except Wedneſday; and every day paſſing through north and ſouth two coaches, two diligences. Alſo to the weſtward, Leeds, Liverpool, &c. two diligences.

The walks and proſpects about Croft are particularly pleaſing. Half a mile below, on a high bank of the river, is the delightful village of Hurworth: and further, in its ſerpentine courſe, Middleton, Sogburn, Dinſdale, &c. The laſt will afford much amuſement from the locks laid acroſs the river, and large ſalmon fiſhery below, as well as its romantic ſituation, environed by woods and high brown rocks.

I have only to obſerve, that the market of Darlington ſupplies butchers meat, and other neceſſaries of life, at very reaſonable prices; and is alſo well ſtocked with fiſh of all kinds, being within 20 miles of the ſea coaſt.

So many advantages and conveniences to be enjoyed at Croft, added to the virtues of its Sulphur-water, which we have pointed out, muſt, we make no doubt, attract the attention of the public, and reſtore to this ſweet and healthful village, the fame to which it is ſo well entitled.

FINIS.